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REQUEST FOR QUALIFICATIONS

Phase 3: LiDAR Mapping for Floodplain Hazard Identification
Ravalli County, Montana

Project Description

The Ravalli County Planning Department is soliciting submissions of qualifications from Light Detection and Ranging (LiDAR) acquisition contractors to obtain high-resolution digital topographic data and generate 2-foot contours for an area of approximately 60.2 square-miles. The work is being completed in phases as part of a countywide topographic mapping project for floodplain hazard identification. This is the third and final planned phase which primarily covers the East and West Forks of the Bitterroot River in Ravalli County, Montana.

Submittal Deadline

Submissions are due by **5:00 pm, Mountain Standard Time, on Friday, September 23, 2011**.

Background Information

Ravalli County has experienced significant growth for much of the last two decades, and is consistently recognized as one of the top five fastest growing counties in Montana. Ravalli County encountered 10.7% population growth from 2000 to 2005 and anticipates an 85% increase in population by 2050. With increasing development pressures and demands for waterfront property, the identification of flood prone areas is critical to the management of growth and the preservation of resources, which attract residents to Ravalli County.

As a participant in FEMA's National Flood Insurance Program (NFIP), Ravalli County regulates development within the 100-year floodplain of the Bitterroot River. The Bitterroot River is the trunk of the watershed with hundreds of tributary streams, which combined drains an area of about 2,400 square miles. Although approximately 60 river miles of the main stem floodplain have been mapped, only four of the tributary's floodplains have been identified, including the East and West Forks.

Accurate floodplain maps are necessary tools for communities to effectively identify and mitigate flood hazards. Current Flood Insurance Rate Maps (FIRMs) used for floodplain identification in Ravalli County are based on topographic information from United States Geological Survey (USGS) quadrangle maps with contour intervals ranging from 20 to 40-feet. Because the existing FIRMs are based on such coarse data, they frequently provide an

imprecise delineation of the 100-year floodplain boundary. Therefore, it is often necessary for the County to request more specific elevation data from proposed floodplain development to provide sound floodplain hazard identification. It would therefore be beneficial for Ravalli County, its residents, and other agencies, to have more detailed initial topographic data to increase the precision of floodplain studies and decrease the burden on residents to provide floodplain elevation data.

Recognizing the benefit of more detailed topographic data, Ravalli County has successfully applied three times for funding LiDAR data acquisition through Renewable Resource Grants from the Montana Department of Natural Resources and Conservation. This third and final phase was awarded a grant worth $75,000 to complete LiDAR mapping of the East and West Forks of the Bitterroot River.

Project Area

The primary project area is the floodplain of the East and West Forks of the Bitterroot River within Ravalli County, Montana. The project area also includes the floodplains for Skalkaho Creek, Rye Creek, Sleeping Child Creek, Little Sleeping Child Creek, and the Nez Perce Fork. Generally, the northern boundary for the main interest area is the Phase 2 project limit located between the Town of Darby and the community of Conner. The approximate southern boundary is the Painted Rocks Reservoir dam on the West Fork, and Section 20, Range 17W, Township 2N on the East Fork.

Land cover in the mapping area varies from rural open pasture to densely forested, while the terrain varies from flat to rugged and steeply sloped. This mapping phase covers more mountainous terrain than the previous two mapping phases that covered the Bitterroot River's main stem.

The total coverage area is approximately 60.2 square miles. An ESRI shapefile of the coverage area is available at http://rc.mt.gov/planning/land.mcpx.

Deliverables

In general, the performance standards for this project are FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*. At a minimum, all digital elevation data delivered shall meet a 0.5 foot (15 centimeter) root mean square error (RMSE) vertical accuracy and 2.2 feet (67 centimeter) RMSE(r) horizontal accuracy. A State of Montana registered Professional Land Surveyor (PLS) is required to oversee and certify the accuracy of all mapping products. The cost of all products and associated work shall be included in the price proposal. The selected contractor will be responsible for the following (note that some standards listed herein may exceed the FEMA G&S):

- FEMA Compliant Metadata
- LiDAR Tile Index. Offeror shall utilize a tile index & naming convention that is compliant with FEMA standards and specifications that best fits the proposed project boundaries.
- Raw Mass Point Data (post calibrated, pre-filtered): Irregularly spaced LiDAR elevation points in LAS (LiDAR Archive Standard v1.1) format. Average raw point spacing of irregularly spaced mass points shall be 1.4m maximum.
- Bare-Earth Digital Elevation Model (DEM) Data in LAS v1.1 format
- 2-foot contours based on LiDAR data acquisition in ESRI Shapefile (.shp) format.

Coordinate system shall be Montana State Plane NAD 83 **Meters** Zone 2500.

- 2-foot contours based on LiDAR data acquisition in AutoCAD (.dwg) format. Coordinate system shall be Montana State Plane NAD 83 **Feet**.
- Contour lines generated from the data acquired and processed under this project shall match and blend seamlessly with existing 2-foot contour lines from Ravalli County Phase 3 LiDAR mapping at all phase boundaries.
- Ground Control/Calibration
- QA/QC & FEMA Checkpoint Survey
- Post-Project Reporting. The report shall meet all the requirements listed in FEMA G&S Appendix A Section 8.7.2. In general, the documentation shall include: LiDAR system report; flight report, ground control report, ellipsoid model used; data processing procedures; system calibration report and accuracy analysis using check point survey.

Vertical Datum

All survey ground control points shall use North American Vertical Datum of 1988 (NAVD88) datum for initial elevation control. Digital terrain models shall be delivered in NAVD88 datum.

Permission

The offeror shall be responsible for obtaining all permits, permission, or traffic control that may be required to enter upon any lands or use of any Public Right-of Way where access to accomplish the ground control survey is necessary.

Reference Materials

1) Figure 1: Ravalli County Phase 3 LiDAR Acquisition Areas
2) Shapefile for Ravalli County Phase 3 LiDAR Acquisition Areas available at http://rc.mt.gov/planning/land.mcpx.
3) Federal Emergency Management Agency's (FEMA) "*Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A: Guidance for Aerial Mapping and Surveying*" (FEMA G&S, Appendix A).
4) Federal Emergency Management Agency's (FEMA) "*Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix N: Data Capture Standards*" (FEMA G&S, Appendix N).

Project Timeline

The anticipated negotiation period for the selection and contracting of a LiDAR mapping specialist will begin in late September, 2011 and will be settled within one to two weeks. LiDAR collection should begin during "leaf-off snow-free" conditions in October or November of 2011. Final data products shall be submitted within 60-days of final acquisition.

Offeror shall submit an estimated progress schedule as to time and costs at the beginning of the work, and monthly progress reports thereafter until complete. The reports will include any problems, potential problems, and delays as foreseen by the Contractor. Reports will be submitted in a timely manner to permit prompt resolution of problems.

Minimum Qualifications

Interested contractors shall demonstrate that they possess the following minimum qualifications:

- Extensive experience with LiDAR topographic mapping techniques, field surveying (ground control and breaklines), Digital Elevation Models (DEMs), and automated and

manual post-processing of data.

- Thorough knowledge and understanding of FEMA's Map Modernization Program and *Guidelines and Specifications for Flood Hazard Mapping Partners* (http://www.fema.gov/plan/prevent/fhm/gs_main.shtm).
- Experience in the use of GIS applications related to topographic and flood hazard mapping within regions of similar geography, ground cover and watershed characteristics.
- Consultant must assemble a highly qualified professional team with appropriate background and experience to conduct the required work and produce deliverables on time and within budget. The selected consultant must be responsible for managing its team members, including sub consultants, as necessary.
- Any parties responsible for completing engineering or surveying work must have valid Professional Engineer (PE) and/or Professional Land Surveyor (PLS) licenses as required by the Montana State Board of Professional Engineers and Professional Land Surveyors.

Submittal Requirements

The following information must be submitted:

- *Contact information*: name, address, phone number and email address of the consulting firm.
- *Form of organization*: identify whether firm is a partnership, corporation or sole proprietorship, where it is organized and the names of principals, officers and directors of the firm.
- *Key personnel*: names of key personnel, their respective titles, proposed roles on the project team, experience, and periods of service with the firm.
- *Statement of qualifications*: a narrative or other statement by the firm of its understanding of LiDAR and flood hazard mapping, the firm's general approach to the proposed project, and firm's qualifications for the proposed project.
- *Conflicts of Interest*: a statement addressing potential conflicts of interest, if any, regarding the proposed work in Ravalli County.
- *Availability*: a brief statement of the availability of key personnel of the firm to undertake the proposed project.
- *Project list*: list of similar/relevant projects completed by the firm.
- *References*: names and telephone numbers of persons whom the agency can call for references regarding the firm's past performance, preferably on similar projects. Please identify the roles of the proposed key personnel on any similar projects that are listed.
- *Cost proposal*. The offeror's cost proposal shall be inclusive of all specifications and deliverables listed herein. The total amount available for the project is $75,000 with no additional funding possible. The offeror's cost proposal will be weighted and considered during the selection process.

Selection Process

All complete Statement of Qualifications will be reviewed and evaluated by a selection committee composed of the Ravalli County Board of County Commissioners, designated County personnel, and Montana Department of Natural Resources and Conservation staff. The selection committee, with confirmation of the Board of County Commissioners, may invite the most qualified and experienced firms to participate in interviews and rank the firms based upon their qualifications and experience. Ravalli County will negotiate a contract,

including a detailed scope of work, budget and schedule, with the firm that the County determines to be the most qualified. In the event that the County cannot successfully negotiate a contract with the selected firm, the County will negotiate a contract with the next most qualified firm. The County reserves the right to refuse all submittals and re-advertise at a later date.

Submittal Deadline & Contact Information

Qualification information may be provided in any manner deemed appropriate and must clearly demonstrate the interested firm's ability to successfully complete a project of this type. The deadline for submission of qualifications is 5:00 P.M., Mountain Standard Time, Friday, September 23, 2011. **Five (5) copies** of the statement of qualifications must be submitted to the address below. Late or incomplete submittals will NOT be evaluated and emailed or faxed submittals will not be accepted.

We are also aware that Missoula County (adjacent to Ravalli County) is currently seeking LiDAR services and are willing to coordinate scheduling for flight efficiencies if possible.

Project related questions and submissions may be directed to:

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